

AN ANNOTATED LIST OF TREEHOPPERS (HOMOPTERA: MEMBRACIDAE) OF DELAWARE¹

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ABSTRACT: Sixty-one membracid species are reported for Delaware of which 48 are new state records. The species list includes information on their locality, seasonal occurrence and biology, including plant species association.

Thirteen species of membracids have been previously reported from Delaware (Bray and Triplehorn 1953, Metcalf and Wade 1965, Kopp and Yonke 1973b, c). Nine of these were reported by Bray and Triplehorn in association with red and pin oaks.

The present list includes 61 species, 48 of which are new state records. Records on all but one species (*Ophiderma salamandra* Fairmaire) in the list are based upon recent field collections (Mason and Loye 1981) and examination of specimens in museum collections. Determinations of species were verified by Duane Flynn of Michigan State University.

The arrangement of taxa in the list follows that of Kopp and Yonke (1973a, b, c, 1974). Species within each genus are listed alphabetically. Information listed for species collected in this study includes: locality and (or) county, range of seasonal occurrence, host data and biological notes where available. Gleason and Cronquist (1963) was used as a source for the host identifications. For museum specimens, information is given on locality and months when they were collected. This information was obtained from specimens in the University of Delaware Entomological Collection.

More extensive collecting is needed to determine the extent of the membracid fauna in the state. Our list represents a compilation of known Delaware species. However, about 40 other species not listed here have been reported from adjacent states and should be present in Delaware. We hope this publication will stimulate additional investigations on the Membracidae in Delaware.

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Family Membracidae

Subfamily Centrotinae

- * *Microcentrus perditus* (Amyot and Serville). Newark, New Castle Co. Aug. 8.

Subfamily Hoplophorioninae

- * *Platycotis vittata* (F.). Newark, New Castle Co.; Georgetown, Sussex Co. June 19 – July 4.
Quercus alba.

Subfamily Membracinae

- Campylenchia latipes* (Say). Newark, New Castle Co. June 12 – Oct. 31. *Erigeron annuus*, *Solidago* sp. Nymphs collected from *Solidago* sp. root feeding at the surface of the ground 4th week of May and 1st week of June. Aggregation and ant attendance seen for nymphs, but not adults. Museum specimens: Newark, New Castle Co., July; Dover, Kent Co., July and Aug.; Glasgow, New Castle Co., Aug.
- * *Enchenopa binotata* (Say). Newark and Wilmington, New Castle Co.; Dover, Kent Co. June 5 – Sep. 22. *Carya glabra*, *Juglans nigra*. Nymphs collected from *J. nigra* and *C. glabra* June 3-26 were attended by ants.

Subfamily Smiliinae

Tribe Acutalini

- * *Acutalis tartarea* (Say). Newark, New Castle Co. June 5 – Oct. 1. *Ambrosia artemisiifolia*, *Arctium minus*, *Erigeron annuus*, *Eupatorium* sp., *Solidago* sp. Nymphs collected from *Solidago* sp. June 10-26. Museum specimens: Odessa, New Castle Co., June, July.
- * *Microtalis calva* (Say). Newark, New Castle Co.; Dover and Woodland Beach, Kent Co. June 26 – Sep. 5. *Solidago* sp., *Spartina* sp.

Tribe Ceresini

- Hadrophallus borealis* (Fairmaire). Newark, New Castle Co. May 24 – Aug. 3. *Ambrosia artemisiifolia*, *Liquidambar styraciflua*, *Malus* sp., *Morus* sp., *Solidago* sp. Museum specimens: Newark, New Castle Co., Aug.
- * *Stictocephala bisonia* Kopp and Yonke. Newark, New Castle Co. July 21 – Aug. 29. *Arctium minus*, *Asclepius syriaca*, *Glycine max*, *Solidago* sp. Museum specimens: Camden, Sep., Nov., and Dover, Aug., both Kent Co.; Newark, July and October.
- S. brevitylus* (Van Duzee). Newark, New Castle Co. Apr. 29 – June 20. *Liriodendron tulipifera*, *Quercus bicolor*, *Q. borealis*, *Sambucus canadensis*, *Smilacina racemosa*, *Solidago* sp.
- * *S. diceros* (Say). Newark, New Castle Co. July 23 – Aug. 12. *Arctium minus*, *Sambucus canadensis*. Museum specimens: Odessa, New Castle Co., July.
- * *S. lutea* (Walker). Newark. June 4-18. Museum specimens: Newark, New Castle Co., July and Nov.
- * *S. taurina* (Fitch). Newark and Claymont, New Castle Co. July 27 – Oct. 12. *Liquidambar styraciflua*.
- * *Tortistilus inermis* (Fitch). Museum specimen: "Dunraven", DE, July, 1961.
- * state records

Tribe Polyglyptini

Entylia bactriana Germar. Museum specimens: Wilmington, New Castle Co., Aug. and Sep.

- * *E. carinata* (Forster). Newark and Wilmington, New Castle Co. May 26 – Oct. 23. *Ambrosia artemisiifolia*, *Arctium minus*, *Cirsium pumilum*, *Prunus serotina*. Nymphs collected June 19 – July 19 from *C. pumilum*. Eggs present in ventral midrib of leaves of *C. pumilum* were collected June 2 – July 14. Females seen “brooding” eggs and nymphs on *C. pumilum*. Two egg masses had 101 and 76 eggs, respectively. Ant attendance seen for nymphs and adults. Museum specimens: Dover, Kent Co., Aug.; Yorklyn, New Castle Co., May and Sep.; Bridgeville, Sussex Co., Aug.
- E. sinuata* (F.). Museum specimen: Newport, New Castle Co. July 24, 1951.
- * *Publilia reticulata* Van Duzee. Newark and Hockessin, New Castle Co. June 5-29.
- * *Vanduzeca arquata* (Say). Newark, New Castle Co. June 10 – Nov. 12. *Robinia pseudoacacia*. Nymphs collected May 26 – Aug. 8. Ant attendance seen for nymphs and adults. Museum specimens: New Castle Co., Sep.

Tribe Smiliini

- * *Azymna castancae* (Fitch). Newark, New Castle Co. June 26 – July 27.
- * *A. querci* (Fitch). Newark. May 29 – July 4. *Quercus borealis*, *Q. velutina*, *Rhus radicans*, *R. typhina*. Museum specimens: Dover, Kent Co., July.
- * *Cyrtolobus arcuatus* (Emmons). Newark, New Castle Co. June 19.
- * *C. aureoreus* Woodruff. Newark, New Castle Co.; Redden State Forest and Georgetown, Sussex Co. May 28 – July 6. *Quercus alba*, *Q. borealis*, *Q. nigra*, *Q. phellos*.
- * *C. discoidalis* (Emmons). Newark, New Castle, and Blackbird State Forest, New Castle Co.; Millsboro, Sussex Co. June 1-19. *Quercus alba*, *Q. nigra*, *Q. palustris*, *Q. prinus*, *Q. velutina*. Museum specimen: “Gatesburg”, DE, June, 1893.
- * *C. dixianus* Woodruff. Newark, New Castle Co.; Georgetown, Sussex Co. May 7 – July 5. *Liquidambar styraciflua*, *Quercus bicolor*, *Q. borealis*, *Q. prinus*, *Q. velutina*. Mating pairs observed on *Q. bicolor* June 7 and 10; copulation lasted more than 10 h for one pair.
- C. fuliginosus* (Emmons). Newark, New Castle Co.; Georgetown, Sussex Co. May 29 – Sep. 22. *Quercus borealis*.
- * *C. funkhouseri* Woodruff. Newark, New Castle Co.; Redden State Forest, Sussex Co. June 12-15. *Quercus phellos*.
- * *C. fuscipennis* Van Duzee. Newark, New Castle Co. June 1 – July 13. *Quercus alba*, *Q. borealis*.
- * *C. inermis* (Emmons). Newark, New Castle Co.; Redden State Forest, Sussex Co. June 15. *Carya glabra*.
- * *C. maculifrons* (Emmons). Newark, New Castle Co. June 4-22. *Quercus nigra*.
- * *C. ovatus* Van Duzee. Newark, New Castle Co.; Georgetown, Sussex Co. May 29 – July 12. *Quercus borealis*, *Q. nigra*, *Q. velutina*.
- * *C. pallidifrons* (Emmons). Newark, New Castle Co.; Georgetown, Sussex Co. May 29 – July 13. *Quercus alba*, *Q. bicolor*, *Q. borealis*, *Q. velutina*, *Q. lyrata*.
- * *C. pulchellus* Woodruff. Newark, New Castle Co. June 1-10. *Quercus alba*.
- C. puritanus* Woodruff. Newark, New Castle Co. June 15. *Quercus alba*.
- * *C. tuberosus* (Fairmaire). Newark and New Castle, New Castle Co. May 16 – July 19. *Liriodendron tulipifera*, *Quercus alba*, *Q. bicolor*, *Q. borealis*, *Q. velutina*. Mating pair collected from *Q. bicolor* May 28.
- * *C. vau* (Say). Newark and Blackbird State Forest, New Castle Co.; Dover, Kent Co.; Georgetown and Redden State Forest, Sussex Co. May 25 – July 28. *Quercus alba*, *Q. borealis*, *Q. marilandica*, *Q. phellos*.

- Ophiderma definita* Woodruff. Newark, New Castle Co. June 14 – July 19. *Quercus alba*, *Q. borealis*.
- * *O. evelyna* Woodruff. Newark, New Castle Co.; Bridgeville, Millsboro and Rehoboth Beach, Sussex Co. June 5-6. *Quercus borealis*, *Q. marilandica*. On June 6, 1979, 101 males and no females were taken in a black-light trap at Rehoboth Beach.
- * *O. Flava* Goding. Newark, New Castle Co. May 28 – Aug. 28. *Quercus alba*, *Q. velutina*, *Rhus radicans*.
- * *O. flavicephala* Goding. Newark, New Castle Co.; Redden State Forest, Sussex Co. May 25 – June 24. *Quercus alba*, *Q. borealis*, *Q. nigra*, *Q. phellos*. Museum specimens: Newark, New Castle Co., June.
- O. pubescens* (Emmons). Newark, New Castle Co.; Georgetown, Sussex Co. June 1 – July 10. *Quercus borealis*, *Q. velutina*.
- O. salamandra* Fairmaire. Kopp and Yonke (1973c).
- * *Smilia camelus* (F.). Newark, New Castle Co.; Redden State Forest, Sussex Co. May 25 – July 10. *Quercus alba*, *Q. borealis*, *Q. marilandica*, *Q. phellos*, *Q. velutina*.
- Xantholobus intermedius* (Emmons). Newark, New Castle Co. July 5.
- * *X. lateralis* Van Duzee. Newark, New Castle Co. May 25 – June 4. *Quercus bicolor*, *Q. borealis*, *Q. velutina*.
- * *X. muticus* (F.). Newark, New Castle Co. May 22 – July 4. *Quercus borealis*, *Q. velutina*. A female was observed ovipositing June 19 at 1645 hr. on *Q. borealis*.

Tribe Telamonini

- * *Archasia belfragei* Stal. Newark, New Castle Co. June 10 – July 13. *Quercus alba*, *Q. borealis*, *Q. phellos*.
- * *Carynota mera* (Say). Newark, New Castle Co. Aug. 2-29.
- * *Glossonotus acuminatus* (F.). Newark, New Castle Co.; Georgetown, Sussex Co. June 5 – Sep. 14. *Quercus alba*, *Q. bicolor*, *Q. palustris*.
- * *G. crataegi* (Fitch). Newark and Hockessin, New Castle Co. July 5-19. *Fagus grandifolia*.
- * *Heliria cristata* (Fairmaire). Newark, New Castle Co. June 20.
- * *H. molaris* (Butler). Newark, New Castle Co. June 12 – Oct. 1. *Quercus alba*, *Q. bicolor*, *Q. velutina*. Fifth instar molting nymph was collected from *Q. bicolor* June 1.
- * *Helonica excelsa* (Fairmaire). Newark, New Castle Co. June 12 – Aug. 17. *Quercus alba*, *Q. palustris*.
- * *Telamona ampelopsidis* (Harris). Newark, New Castle Co. June 26 – Aug. 17.
- * *T. collina* (Walker). Newark, New Castle Co. Sept. 21.
- * *T. decorata* Ball. Newark, New Castle Co.; Georgetown, Sussex Co. June 12 – Sep. 24. *Quercus bicolor*, *Q. phellos*. Fifth instar nymph observed molting on *Q. bicolor* 2nd week of June.
- * *T. extrema* Ball. Newark, New Castle Co.; Atlanta and Georgetown, Sussex Co. June 15 – Aug. 25. *Quercus phellos*.
- T. monticola* (F.). Newark, New Castle Co. June 4 – Sep. 15. *Quercus bicolor*, *Q. borealis*, *Q. phellos*, *Q. velutina*. Nymphs collected from *Q. bicolor* and *Q. borealis* Apr. 30 – June 7.
- * *T. tiliae* Ball. Newark, New Castle Co. June 13 – Aug. 2. *Liquidambar styraciflua*, *Quercus borealis*. Nymphs collected from *Q. borealis* June 13.
- * *T. unicolor* Fitch. Newark, New Castle Co. June 6 – Aug. 17. *Carya glabra*. Two ant attended fifth instar nymphs were collected the 3rd week of May.
- * *T. westcotti* Goding. Newark, New Castle Co. July 27.
- Thelia bimaculata* (F.). Newark and Hockessin, New Castle Co. July 7 – Aug. 6. *Robinia pseudoacacia*, *Fagus grandifolia*. Museum specimens: New Castle Co., June, Aug., Oct.

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BOOKS RECEIVED AND BRIEFLY NOTED

The following are Univ. of California Publications in Entomology, Univ. of Calif. Press, Berkeley:

SUPPLEMENTARY STUDIES ON THE SYSTEMATICS OF THE GENUS *PERDITA* (HYMENOPTERA: ANDRENIDAE). Part II. P.H. Timberlake. 1980. Vol. 85. 65 pp. 62 figs. \$8.00.

REVIEW OF NORTH AMERICAN *EXOMALOPSIS* (HYMENOPTERA: ANTHOPHORIDAE) Parts I - IV (subgenera *Anthophorula*, *Anthophorisca*, *Phanomalopsis*, *Megomalopsis*, *Panomalopsis* & *Exomalopsis*). P.H. Timberlake. 1980. Vol. 86. 158 pp. 257 figs. \$17.00.

(Continued on page 47)